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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,731	06/27/2003	Craig A. Vincze	378-21-011	7693

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EXAMINER
THOMPSON, JEWEL VERGIE

ART UNIT	PAPER NUMBER
2855	

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/608,731	VINCZE ET AL.	
	Examiner	Art Unit	
	Jewel V Thompson	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8, 11-30 and 33-48* is/are rejected.

7)☒ Claim(s) *9, 10, 31 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/6 and 12/5/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. Acknowledgement is made of the Information Disclosure Statement filed October 6, 2003 and December 5, 2003, which has been made record of and placed in the file.

Claim Rejections - 35 USC § 102

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-**4, 7, 8, 12-15,17-19, 24-28, 33, 34, 36, and 39-42** are rejected under 35 U.S.C. 102(e) as being anticipated by Inushima et al (6,550,325).

Regarding claims 1 and 23 Inushima et al teaches a mass flow meter (MFM) structure, comprising: a conduit (51) for conducting a fluid flow, and at least four mutually spaced temperature sensors (53, 55, 56 and 57) disposed to sense the temperature of a fluid flowing within the conduit, the sensors connected in a 4-sensor bridge circuit (col. 30, lines 47-49, col. 29, lines 58—61, fig. 5C) to sense the mass flow rate of a fluid flowing through the conduit.

Regarding claim 2, Inushima et al teaches the sensors are discrete and are distributed symmetrically with respect to the conduit (5A).

Regarding claim 3, Inushima et al teaches the sensors comprising semiconductor chips (col. 6, lines 19-31).

Regarding claims 4-7, 24-28 Inushima et al teaches the sensors comprising SiC chips; a SiC oxide interfacing between the SiC chips and the conduit; the sensors comprising silicon chips; a silicon oxide interfacing between the silicon chips and the conduit (col. 26, lines 11-16, col. and (figs. 1A-C and 5A-C).

Regarding claim 8, 30 Inushima et al teaches an electrically insulative film enclosing the sensors, and a circuit on the exterior of the film and extending through the film to contact the sensors (5A-5C).

Regarding claim 12, Inushima et al teaches the sensors comprising a pair of upstream sensors distributed symmetrically with respect to the conduit at an upstream location, and a pair of downstream sensors distributed symmetrically with respect to the conduit at a downstream location (fig. 5).

Regarding claim 13, Inushima et al teaches the bridge circuit including extended leads between the upstream and downstream sensors long enough to be substantially non-thermoconductive (fig. 5C).

Regarding claim 14, Inushima et al teaches the sensors include respective AIN substrates that are mounted to the conduit (fig. 5A and 5B).

Regarding claim 15,Inushima et al teaches electronic circuitry for actuating the sensors and determining the mass flow rate of a fluid flowing through the conduit from the sensors (col. 30, lines 46-49).

Regarding claims 17 and 42, Inushima et al teaches a control valve governing the fluid flow through the conduit under the control of the circuitry (col. 53, lines 50-55)

Regarding claim 18, Inushima et al teaches the sensors are mounted inside the conduit on protective shields and protected from the environment within the conduit by the shields (fig. 5A).

Regarding claim 19, Inushima et al teaches a conduit for conducting a fluid flow, at least one temperature sensor (53) disposed to sense the temperature of a fluid flowing through the conduit, each sensor comprising an AIN substrate (59) bearing a temperature sensing circuit (5C), and electronic circuitry for actuating the sensors and determining from the sensors the mass flow rate of a fluid flowing through the conduit (col. 30, lines 49-50).

Regarding claim 33, Inushima et al teaches the electric circuitry senses the temperature within the conduit as a function of the sensor resistance (fig. 5C).

Regarding claim 34, Inushima et al teaches the sensor is mounted to the outer surface of the conduit in thermal communication with a fluid flowing through the conduit (14A and 14B).

Regarding claim 36, Inushima et al teaches the sensor is mounted to an inner surface of the conduit (fig. 5A)

Regarding claim 39, Inushima et al teaches the at least one temperature sensor comprising a plurality of temperature sensors that are symmetrically arranged with respect to the conduit (fig. 5A).

Regarding claim 40, Inushima et al teaches the at least one temperature sensor comprising a plurality of temperature sensors that are electrically connected in a bridge circuit (figs. 5A and 5C).

Regarding claim 41, Inushima et al teaches the bridge circuit incorporating a pair of upstream temperature sensors and a pair of downstream temperature sensors (fig. 5C).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 20, 22 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inushima et al in view of Busta (4,744,246).

Regarding claims 11, 20, Inushima et al fails to teach the sensors comprising thin film tungsten layers on respective AIN substrates. Busta teaches the hot wire is made of tungsten (col. 1, lines 26-28). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have used the material of tungsten as used by Busta in the flow sensor of Inushima et al for the purpose of providing strength to the sensor.

Regarding claim 21and 29 Inushumia et al teaches each AIN substrate is mounted to the outer surface of the conduit to conduct heat from the conduit to its respective temperature sensing circuit (fig. 14A).

Regarding claim 22, Inushmia et al teaches a control valve (344) governing the fluid flow through the conduit under the control of the circuitry.

4. Claims 35, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inushima et al in view of Kawai et al.

Regarding claim 35 and 38, Inushmia et al fails to teach the sensor is mounted within a respective opening in a wall of the conduit and projects into the interior of the conduit. Kawai et al teaches a sensor which is mounted within a wall of the conduit (fig. 4). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have used the same type of structure as that of Kawai et al in the apparatus of Inushmia et al for the purpose of creating a passage to further protect the flow rate detector.

Regarding claim 37, Inushima et al fails to teach the sensor is mounted inside the conduit on a protective shield and protected by the shield from the environment within the conduit. Kawai et al teaches a sensor which is mounted inside the conduit on a protective shield (fig. 4). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have shielded the flow sensor as that of Kawai et al in the apparatus of Inushmia et al for the purpose of further protecting the sensor as to maintain accurate measurements.

5. Claims 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inushima et al in view of Eiermann et al (4,366,709).

Regarding claim 43, Inushima et al teaches electrically connecting each the sensor to sense the temperature of a fluid flowing through the conduit (5A and 5C), however Inushima et al fails to teach bonding at least one discrete chip-type temperature sensor to a conduit. Eiermann et al teaches the temperature-dependent resistance members are mounted in the conduit (col. 6, lines 62-64). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have mounted the temperature-resistance members of Eiermann et al in the conduit of Inushima et al for the purpose of projecting into the flow of intake air and providing a stable connection.

6. Claims 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inushima et al in view of Eiermann et al as applied to claim 43 above, and further in view of McQueen et al (6,208,254).

Regarding claim 44, Inushima et al in view of Eiermann et al fails to explicitly teach each the temperature sensor is bonded to the conduit through a thermally conductive insulator. McQueen et al teaches in col. 22, lines 58-60) a first detector comprising a first temperature sensitive element on electrically insulative, thermally conductive base. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have used the insulation of McQueen et al in the apparatus of Inushima et al for the purpose of providing an operationally effective

thermal transfer between the fluid in contact with the surface and the detector (col. 22, lines 58-64, McQueen et al)

Regarding claim 45 Inushima et al in view of Eiermann et al teaches multiple temperature sensors are located at symmetrical locations with respect to the conduit (fig. 5A). Inushima et al fails to teach the sensors are bonded to the conduit. Eiermann et al teaches the temperature-dependent resistance members are mounted in the conduit (col. 6, lines 62-64). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have mounted the temperature-resistance members of Eiermann et al in the conduit of Inushima et al for the purpose of projecting into the flow of intake air and providing a stable connection.

Regarding claim 46, Inushima et al in view of Eiermann et al teaches a pair of upstream and a pair of downstream temperature sensors with each pair symmetrically arranged with respect to the conduit. Inushima et al fails to teach the sensors are bonded to the conduit. Eiermann et al teaches the temperature-dependent resistance members are mounted in the conduit (col. 6, lines 62-64). It would have been obvious to one of ordinary skill in the art at the time that the invention was made to have mounted the temperature-resistance members of Eiermann et al in the conduit of Inushima et al for the purpose of projecting into the flow of intake air and providing a stable connection.

Regarding claim 47, Inushima teaches connecting the upstream and downstream temperature sensors in a 4-sensor bridge network (5A and 5C)

Regarding claim 48, Inushima et al teaches the sensed temperature as an indication of the mass flow rate of a fluid flowing through the conduit, and controlling the fluid flow rate as a function of the indicated mass flow rate (col. 30, lines 46-49).

Allowable Subject Matter

7. Claims 9, 10, 31 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jewel V Thompson whose telephone number is 571-272-2189. The examiner can normally be reached on 7-4:30, off alternate Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jewel V Thompson

Jvt
August 30, 2004

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